

Report on Solar Panel Installation at Raidighi College

1. Introduction

Solar energy is an increasingly popular and sustainable source of electricity, especially for educational institutions seeking to reduce their carbon footprint and energy costs. In this regard, Raidighi College, located in West Bengal, has undertaken a significant step towards sustainability by installing a rooftop solar power system. This report provides a detailed overview of the solar panel installation at Raidighi College, highlighting the technical aspects of the system, its components, installation process, and funding.

2. Project Overview

The solar power installation at Raidighi College is a 20 KW rooftop system designed to meet the institution's energy needs while promoting renewable energy usage. The installation was completed on June 26, 2022, and was funded by the **West Bengal Renewable Energy Development Agency (WBREDA)**. The entire project was executed by **M/s Larsen & Toubro Ltd.**, a prominent construction and engineering company known for its involvement in renewable energy projects.

3. Technical Details of the Installation

3.1 System Capacity and Power Supply

The solar power system installed at Raidighi College has an array capacity of **20 kW**. This means the solar panels are capable of generating 20 kilowatts of electricity under optimal sunlight conditions. This system is expected to significantly reduce the college's dependency on the local grid, offering both financial savings and environmental benefits by lowering carbon emissions.

3.2 Solar Panel Specifications

The installed solar panels are of the **Adani make**, with each module having a capacity of **325 Wp (Watt-peak)**. The solar array consists of a total of **62 panels**, each contributing to the overall energy generation. The selection of Adani solar modules ensures high efficiency, durability, and performance under varying weather conditions.

The power output of 325 Wp per module is ideal for producing substantial energy, with each module designed to work effectively in the Indian subcontinent's tropical climate. This capacity is suitable for institutions like Raidighi College that require a reliable and steady supply of energy throughout the day.

3.3 Components of the System

The installation includes several critical components that work in conjunction to ensure smooth energy generation and distribution. These components are:

- **Solar PV Modules:** The core of the system, consisting of 62 Adani solar panels, each rated at 325 Wp.
- **Inverter:** The inverter used in this system is manufactured by **L&T (Larsen & Toubro)**, one of India's leading engineering companies. The inverter plays a crucial role in converting the

DC (Direct Current) power generated by the solar panels into AC (Alternating Current) power, which can be used by the college.

- **Energy Meter:** A **bi-directional energy meter** has been installed to monitor the amount of energy generated and consumed. This device is essential for ensuring that any excess energy generated by the solar system can be fed back into the grid, supporting the government's net metering policy.
- **Array Junction Box (AJB):** This box is designed to protect the system from overvoltage, short circuits, and other potential electrical faults.
- **Grid Interfacing Panel:** This component ensures that the energy generated from the solar system can be safely integrated into the grid if there is excess generation.
- **Fire Fighting System:** Given the importance of safety, the system is equipped with a **fire fighting system**. It includes a **6 kg ABC type dry fire extinguisher** and four buckets as a precautionary measure against electrical fires or any unforeseen accidents during system operation.
- **Earthing System:** A robust earthing system has been installed, consisting of a **3-meter-long 50 mm diameter GI wire with 10 SWG** thickness. This ensures safety by preventing electrical shocks or fires due to faults.
- **Data Logger:** This device records the performance of the solar system, providing real-time data about energy production, system status, and any malfunctions.

3.4 Structural Components

The structural components of the installation are made of **non-magnetic SS304 stainless steel**, which is known for its corrosion resistance, durability, and strength. These materials ensure that the solar panels remain secure, even in harsh weather conditions like heavy rains or winds.

4. Installation Process

The installation process was carried out by **M/s Larsen & Toubro Ltd.**, a reputable company known for its expertise in large-scale infrastructure projects. The company handled the entire process, from the initial planning and design stages to the installation and commissioning of the solar system.

The installation took place on the roof of the college, ensuring minimal disruption to the regular functioning of the institution. The process involved mounting the solar panels on robust frameworks, wiring the system to the inverter and energy meter, and ensuring the correct setup of the grid connection.

Once installed, the system underwent rigorous testing to ensure it met all technical standards and safety protocols. The final stage involved connecting the system to the electrical grid and configuring the **bi-directional meter** to facilitate net metering.

5. System Performance and Expected Benefits

The **20 KW solar power system** is expected to generate a significant portion of the energy needed by the college. On average, the system is expected to produce **80-90% of the college's electricity demand**, depending on weather conditions, sunlight hours, and other factors. The excess energy can be fed back to the local electricity grid, allowing the college to receive credits for the energy contributed.

The key benefits of this installation include:

- **Reduction in Electricity Bills:** By generating its own electricity, the college will significantly reduce its monthly electricity bills. Surplus energy sent to the grid may even result in financial compensation or credits from the utility company.
- **Promotion of Renewable Energy:** The installation serves as a model for other institutions, encouraging the adoption of renewable energy in the education sector.
- **Environmental Impact:** The reduction in fossil fuel-based energy consumption directly contributes to a reduction in carbon emissions, aligning with India's renewable energy goals.
- **Energy Independence:** The college becomes less reliant on the local power grid, ensuring a more stable and reliable power supply, especially during grid outages or peak demand times.

6. Safety Measures

As with any electrical installation, safety is of paramount importance. The installation at Raidighi College includes several safety features to ensure the system's safe operation:

- **Fire Safety:** The installation of a **fire extinguisher** (6 kg dry ABC type) and **fire safety buckets** ensures that any potential fire risks are mitigated.
- **Earthing:** The use of a proper earthing system ensures that any fault currents are safely directed to the ground, reducing the risk of electric shocks.
- **Data Logger:** Continuous monitoring of the system's performance ensures early detection of faults or inefficiencies, allowing for timely interventions and maintenance.

7. Conclusion

The installation of a **20 KW solar power system** at **Raidighi College** is a significant milestone in the institution's efforts towards sustainability. With high-quality components, an efficient setup, and robust safety measures, the system is poised to reduce energy costs, promote renewable energy, and set an example for other educational institutions in the region. Funded by **WBREDA** and executed by **Larsen & Toubro Ltd.**, this project not only benefits the college but also contributes to the broader goal of reducing carbon emissions and advancing clean energy technologies.

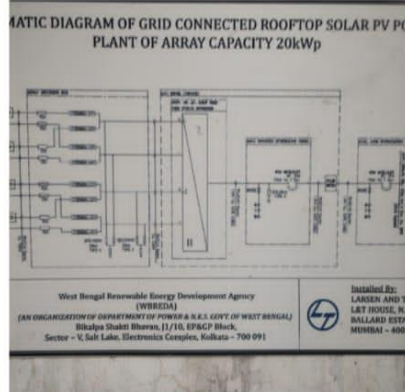
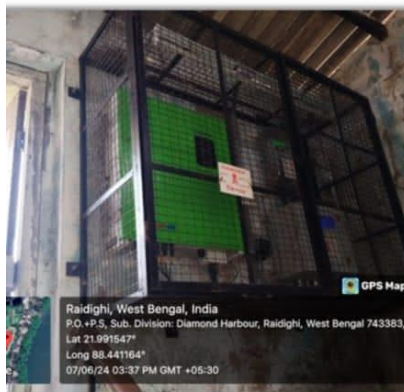
The system's installation reflects the growing shift towards renewable energy solutions in India and highlights the importance of such initiatives in tackling climate change and achieving energy sustainability.




RAIDIGHI COLLEGE
(NAAC Accredited Cycle - 1 on 05.11.2016)
P.O. & P.S. -Raidighi, South 24 Parganas, Pin- 743383
Mobile No. 9735310008 Phone No. +91-3218-358262
Website – www.raidighicollege.in
Email – raidighicollege95@gmail.com



INSTALLED SOLAR PANEL AT RAIDIGHI COLLEGE




Dr. Sasabindu Jana
Principal
RAIDIGHI COLLEGE